REMARKS

Claims 1-44, 46-50, and 52-63 are pending in the present application. Claims 45 and 51 have been canceled. Claims 1, 10, 17, 24, 30, 36 and 43 are independent.

Art Rejections

Claims 1-42 are rejected under 35 U.S.C. § 102(a) as being anticipated by Karighattem (USP 6,594,776). Claims 43-63 are rejected under 35 U.S.C. § 103(a) as being unpatentable over Karighattem. These rejections, insofar as they pertain to the presently pending claims, are respectfully traversed.

The presently claimed invention utilizes a virtual addressing technique that is completely absent from Karighattem. More specifically, the claims variously recite either a mechanism-based virtual address or a role-based virtual address neither of which is disclosed or suggested by Karighattem.

Virtual addressing, as utilized and claimed by the present invention, provides an efficient mapping between a plurality of static addresses and a virtual address. Static addressing, such as that utilized by Karighattem, requires careful and complex tracking of each static address as well as updating of the static address at all devices that may need to access the mechanism with the static address. In contrast, the present invention utilizes a virtual address scheme which is permitted to float between multiple static addresses, which is a concept completely absent from Karighattem.

In Karighattem, there is provided a network client server computer system 110, as shown in Figure 2, having a redundant network interface card (NIC). Upon failure of the primary NIC, the static addresses utilized by the system are changed. More specifically, in the normal operating

condition, Ethernet switch A initially stores the media access control (MAC) address of the primary NIC in its address table. This MAC address of the primary NIC is a static address which is stored at the Ethernet switch A. When the primary NIC malfunctions or fails, the secondary NIC will take over by having the Ethernet switch A delete the MAC address of the server PC from its address table. Recall that upon initialization, both the primary and secondary NICs are programmed with a single common MAC address that is utilized to identify the server PC 114 (see column 3, lines 16-22). Upon failure of the primary NIC, the Ethernet switch A deletes the MAC address of the server PC from its address table. The result is that the secondary NIC will send an LLC broadcast packet to Ethernet switch B. This causes the Ethernet switch B to add the server PC MAC address to its address table, thereby reconfiguring the network. The result is that when the client PC tries to send a packet to the server PC, the primary Ethernet switch A will no longer be able to communicate with the server PC because the MAC address of the server PC will no longer exist in its table. This causes the primary switch A to flood all ports such that the packet sent from the client PC may then be received by the backup Ethernet switch B. Since the backup Ethernet switch B now also has the MAC address of the server PC in its address table, the packet will be forwarded by the backup Ethernet switch B to the server PC. For further details, please see column 3, lines 35-57, as well as the flowchart of Figure 3.

As can be seen from the above description and Karighattem's disclosure, there is no such thing as virtual addressing disclosed therein. In contrast, Karighattem utilizes static addresses, wherein the static MAC address is initially stored in both the primary and secondary NICs. By deleting the MAC address from the primary NIC, backup communication through the backup Ethernet switch B will occur because the backup switch B also has the static MAC address of the

server PC in its address table. This is merely a process of updating the static address and deleting the static address of the server PC to permit the backup NIC to route packets as desired.

In sharp contrast, the claimed invention utilizes a virtual address concept, which virtual address floats between multiple static addresses. As recited in independent claim 1, the first network interface has a first static address which is initially mapped to a mechanism-based virtual address. Furthermore, the claimed second network interface has a second static address. The mechanism-based virtual address may be updated by the management mechanism which updates the mapping associated with the mechanism-based virtual address, such that it is associated with the second static address rather than the first static address upon a malfunction. This remapping of the virtual address from the first to the second static address upon detecting a malfunction in the first network interface is a concept completely absent from and not suggested by Karighattem.

Although the claims are not so limited, one illustrative example of virtual address to static address mapping is as follows. The virtual address may comprise an internet protocol (IP) address while the static addresses may each be separate media access control (MAC) addresses. Thus, the virtual IP address is permitted to float between two distinct MAC addresses. When a failure occurs, the mapping of the virtual address to one of the static addresses may be changed in a simple and efficient manner.

Claim 10 recites similar features to those in claim 1, but also couples the network interfaces to switches. More specifically, the first network interface is coupled to a first network switch, while the second network interface is coupled to a second network switch. More importantly, claim 10 also recites that a virtual address is utilized, specifically a mechanism-based virtual address to which is mapped the first static address of the first network interface. Upon

detecting a malfunction, the management mechanism derives an updated mapping that associates the mechanism-based virtual address with the second static address rather than the first static address. These features are completely absent from Karighattem who clearly utilizes a static addressing technique which writes the same static server address to each of the NICs, so that upon failure of one of the NICs, the other NIC may utilize the static address already initialized for it so that it may route packets to the server.

Independent claim 24 also recites similar distinguishing features including a mechanism-based virtual address that may be associated with either a first static address or a second static address. More particularly, independent claim 24 recites a computer readable medium in a communication mechanism including instructions that, upon detecting a malfunction, derive an updated mapping by associating the mechanism-based virtual address with the second static address rather than the first static address. These features are not taught or suggested by Karighattem.

Likewise, independent claim 30 also recites a mechanism-based virtual address in the context of a computer readable medium within a communication mechanism. Distinguishing features of claim 30 include the instructions for causing one or more processors to, upon detecting a malfunction of the first network switch, derive an updated mapping by associating the mechanism-based virtual address with a second static address rather than the first static address. Such a technique is completely absent and not suggested by Karighattem.

Furthermore, amended independent claim 43 also recites this mechanism-based virtual address concept, including a first network interface having a first static address and a second network interface having a second static address, wherein the first communication mechanism has a first mechanism-based virtual address associated therewith. Furthermore, the first management

mechanism can map the first mechanism-based virtual address to either the first static address or the second static address, which are features completely absent from Karighattem.

In addition to the mechanism-based virtual addressing concept, the present invention may also utilize and also claims a role-based virtual address. The mechanism-based virtual addressing permits a virtual address to float between different static addresses such that it is possible to use the same virtual address to access a particular component or mechanism regardless of the static address of the underlying network communication mechanism. Role-based virtual addressing permits a virtual address to float from module to module depending upon the role that the module is playing at a particular time. This is particularly relevant to control and timing modules that may serve both a primary and secondary role, the primary role being the primary actor with the secondary module acting as a backup. Upon failure of the primary module, the roles are switched such that the secondary or backup module becomes the primary and the primary sits in the background waiting to take over until the new primary module fails. In other words, the roles of the modules may change between primary and secondary roles in this example. Role-based virtual addressing permits the roles of modules to be easily and quickly changed.

Role-based virtual addressing is recited in claims 17 and 36, for example. Specifically, claim 17 recites a peer mechanism that has the possibility of failing or malfunctioning. This claim's peer mechanism may operate in a particular role, which particular role has a role-based virtual address associated therewith. As further claimed in claim 17 and as also not found or suggested by Karighattem, upon detecting malfunction in the peer mechanism, the management mechanism derives an updated mapping by associating the role-based virtual address with a first static address.

Karighattem's static addressing technique simply does not disclose or suggest any such role-based virtual addressing, particularly as recited in claim 17.

Claim 36 recites similar features to those in claim 17 but in the context of a computer readable medium in a communication mechanism. Distinguishing features include the instructions that cause one or more processors to, upon detecting malfunction of the peer mechanism, derive an updated mapping by associating the role-based virtual address with the first static address. This updated mapping is also sent to other mechanism in the network such that these other mechanisms use the updated role-based virtual address to send future communications. This is another feature also absent from Karighattem.

For all of the above reasons, taken alone or in combination, Applicants respectfully request reconsideration and withdrawal of the § 102(a) and § 103(a) Karighattem rejections.

Conclusion

Should there be any outstanding matters that need to be resolved in the present application, the Examiner is respectfully requested to contact the undersigned at (703) 205-8000 to conduct an interview in an effort to expedite prosecution in connection with the present application.

If necessary, the Commissioner is hereby authorized in this, concurrent, and future replies, to charge payment or credit any overpayment to Deposit Account No. 02-2448 for any additional fees required under 37 C.F.R. §§ 1.16 or 1.17; particularly, extension of time fees.

Respectfully submitted,

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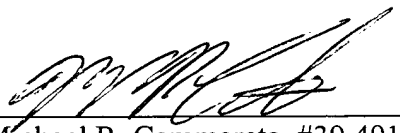
By 
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